

PROJECT NUMBER: 2106
PROJECT TITLE: Cigarette Performance and Design
PROJECT LEADER: R. W. Dwyer
PERIOD COVERED: July, 1988

I. CIGARETTE VENTILATION LEVELS DURING SMOKING (B. Dwyer and D. Leister)

- A. Objective: Determine the effects of cigarette designs on both the filter and rod-wrapper ventilation levels as functions of puff position and puff volume.
- B. Results: A theoretical model of lit-cigarette ventilation and pressure drop has been derived and computer implemented. The model has been tested with lit-cigarette results reported by Harward. The model is in good quantitative agreement with their data.
- C. Conclusions: The greatest change in filter dilution between lit and unlit cigarettes occurs at 50% filter ventilation. This was experimentally observed by Harward. The fraction of diluent air entering the rod wrapper appears independent of filter ventilation level.
- D. Plans: This aspect of cigarette performance and design is being used to refine our expert-system delivery model.
- E. References: C. N. Harward "Simultaneous measurement of dynamic RTD, filter ventilation and carbon monoxide delivery during smoking," P.M. Special Report 85-133, 1985

II. TOBACCO ROD DELIVERIES (J. Kao)

- A. Objective: Determine the effects of puff position and puff volume on the TPM deliveries of unfiltered tobacco rods.
- B. Results: CTS has performed puff-by-puff TPM delivery analyses for us on two tobacco blends at puff volumes ranging from 15 to 45 cc. A predictive model is being developed for these data.
- C. Plans: Cigarette rods have been fabricated at a variety of rod densities and circumferences. These samples will be evaluated for TPM as a function of puff position and puff volume. Currently, the samples are being weight and circumference selected.

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